

PORT LIONS NAVIGATION IMPROVEMENTS FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

REPORT SUMMARY

STUDY INFORMATION

Study Authority. This general investigation study is authorized by the U.S. House of Representatives Public Works Committee Resolution for Rivers and Harbors in Alaska, adopted 2 December 1970. The resolution states:

Resolved by the committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on Rivers and Harbors in Alaska, published as House Document Numbered 414, 83rd Congress, 2nd session; Cook Inlet and Tributaries, Alaska, published as House Document 34, 85th Congress, 1st Session; Copper River and Gulf Coast, Alaska published as House Document Numbered 182, 83rd Congress, 1st session; Tanana River Basin, Alaska, published as House Document Numbered 137, 84th Congress, 1st session; Southwestern Alaska, published as House Document Numbered 390, 84th Congress, 2nd session; Northwestern Alaska, published as House Document Numbered 99, 86th Congress, 1st session; Yukon and Kuskokwim River Basins, Alaska, published as House Document Numbered 218, 88th Congress, 2nd session; and other pertinent reports with a view to determining whether any modifications of the recommendations contained therein are advisable at the present time.

Study Sponsor. Alaska Department of Transportation and Public Facilities (ADOT&PF).

Study Purpose and Scope. This is an interim report in response to the study authority. The purpose of the study is to determine if there is Federal interest in construction of navigation improvements at Port Lions, Alaska.

The primary areas of opportunity are providing adequate wave protection at the existing small boat harbor to reduce damages to vessels and the inner harbor facilities. Additional areas of opportunity include restoring the intended capacity of the mooring basin, reducing travel costs, and increasing capability for subsistence fishing. The study was conducted and the report prepared in accordance with goals and procedures for water resources planning as contained in Engineer Regulation 1105-2-100. Alternatives were examined for their feasibility, considering engineering, economic, environmental, and other criteria.

Project Location/Congressional District. The study area is on the west coast of Settler Cove, an arm of Kizhuyak Bay on the northern coast of Kodiak Island. Port Lions is about 19 miles by air or 40 miles by water west-northwest of the city of Kodiak, Alaska, and 250 miles by air southwest of Anchorage. See Figure 1. The study area is located in the Alaska Congressional District, which has the following congressional delegation:

Senator Ted Stevens (R), Senator Lisa Murkowski (R), Representative Don Young (R)

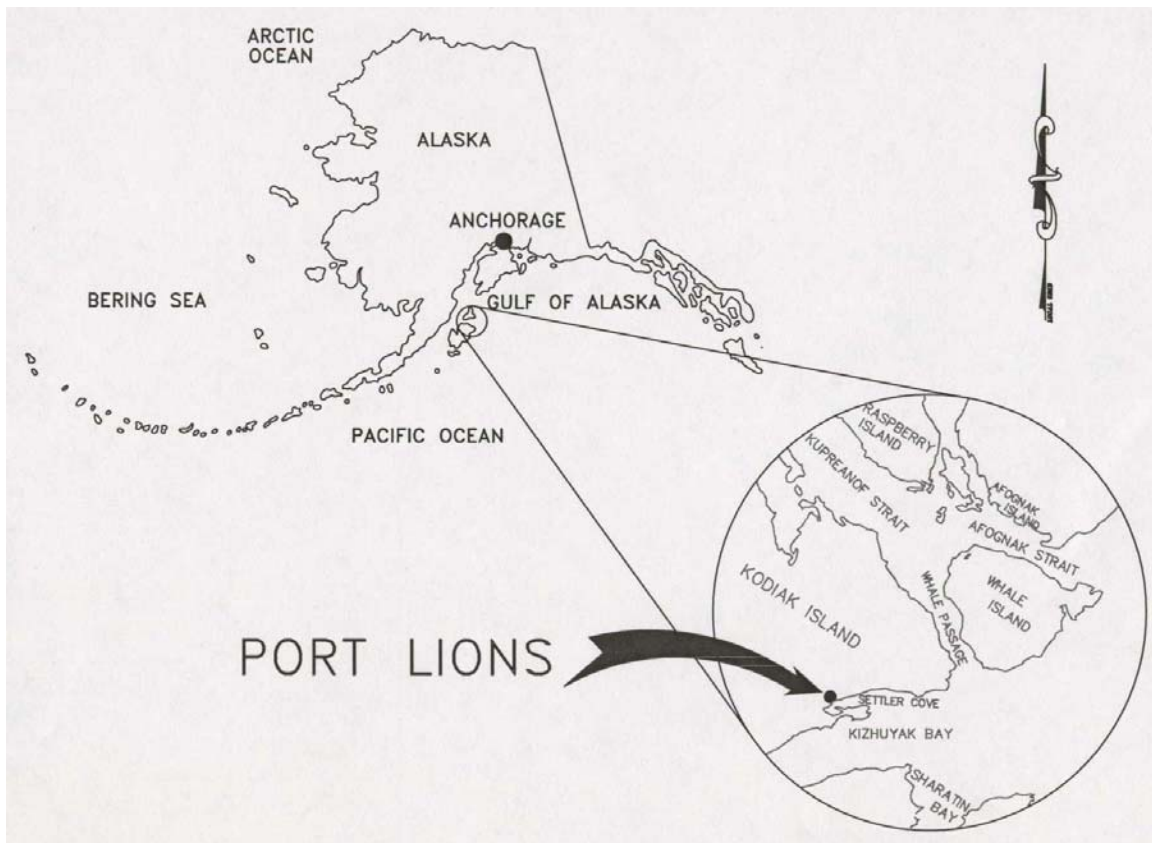


Figure 1. Project Location

Prior Reports and Existing Water Projects.

“Section 905(b) (WRDA 86) Analysis, Port Lions Small Boat Harbor, Port Lions, Alaska,” December 1998. USACE, Alaska District. This report presents problems and opportunities for the exiting Port Lions Harbor. Potential harbor improvements and national economic development benefits are described.

“Draft Expedited Reconnaissance Study of Boat Harbor Improvements, Port Lions, Alaska,” August 1998. Prepared by Tryck Nyman Hayes, Inc., in association with ResourceEcon. This report presents problems and opportunities at the exiting Port Lions harbor. Potential harbor improvements and National Economic Development benefits are described.

“Small Boat Harbor Preliminary Reconnaissance Report, Port Lions, Alaska,” January 1994. USACE, Alaska District. This report summarizes the harbor protection problems and provides four alternatives for improvement of wave protection facilities. A favorable benefit-cost ratio was determined for the construction of a “spur” breakwater for additional protection from northerly waves. The report recommended proceeding to the feasibility study phase; however, further studies were not done because local sponsor funding was not available at that time.

“Detailed Project Report Supplement, Navigation Improvement for Small Boat Harbor, Port Lions, Alaska,” September 1978. USACE, Alaska District. Feasibility level report, which revised the original recommended plan. The revised recommend project consisted of main and stub breakwaters and entrance channel and anchorage basin at natural depths. Information on the

project's design, cost, environmental impacts, and benefit analysis is included.

“Detailed Project Report, Navigation Improvement for Small Boat Harbor, Port Lions, Alaska,” June 1977. USACE, Alaska District. Feasibility level report, which recommended the original recommended plan. This project consisted of two breakwaters, and entrance channel and anchorage basin at natural depths. Comprehensive information on the project's design, cost, environmental impacts, and benefit analysis is included.

The existing Federal navigation project at Port Lions was authorized under Section 107 of the 1960 River and Harbor Act, as amended and approved by the Office of the Chief of Engineers, 9 April 1979. The project initially consisted of a north breakwater 600 feet long and a stub breakwater 170 feet long to protect a five-acre mooring basin. Following completion of the initial project, a severe storm caused extensive damage to the main breakwater. The breakwater was reconstructed and extended for a total length of 725 feet. The authorized depth for the mooring basin and entrance channel is -14 feet, MLLW. See Figure 2.

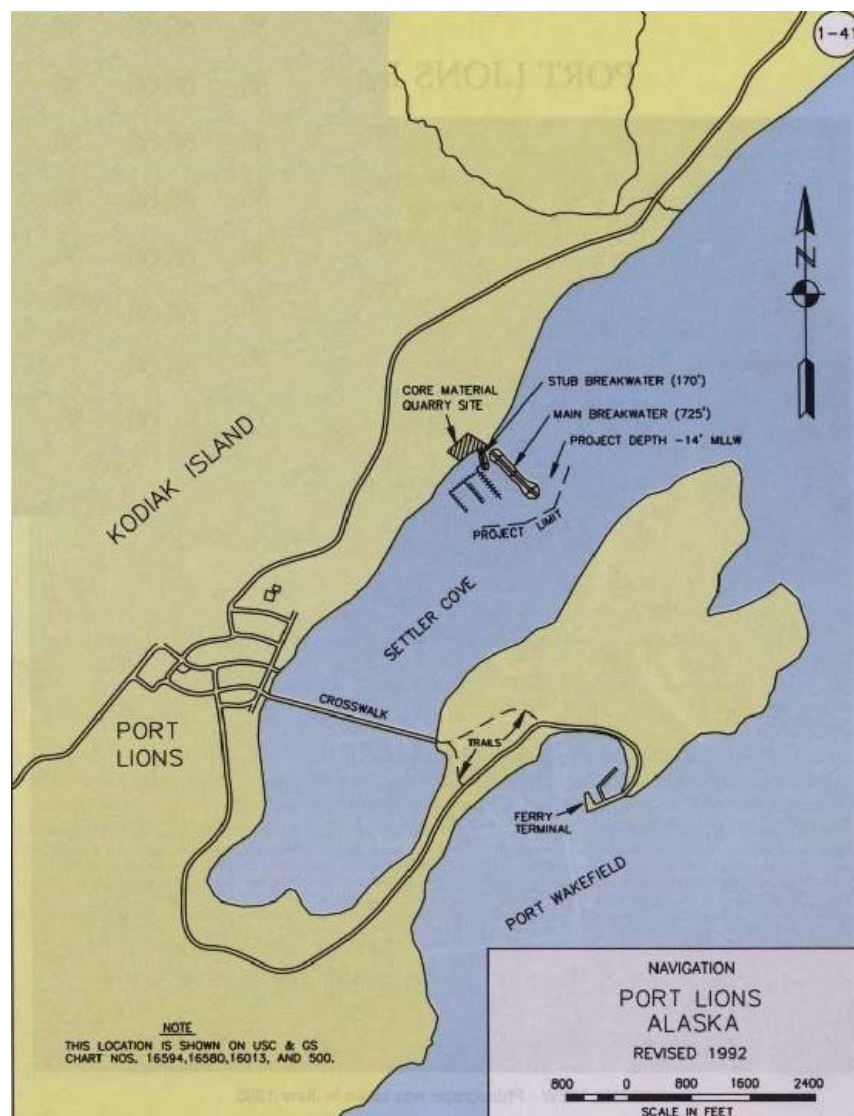


Figure 2. Existing Federal Project at Port Lions

Federal Interest. The study finds that Federal construction of navigational improvements with rubblemound breakwaters, as described in the Recommended Plan, is technically possible, economically justified, and environmentally and socially acceptable. Of the alternatives evaluated in this study, Alternative 3B was found to maximize the net NED benefits and was designated the NED plan. The ADOT&PF is willing to act as the non-Federal sponsor for the project and fulfill all the necessary local cooperation requirements. Thus it is concluded that the navigation improvements described herein should be pursued by the Federal government in cooperation with the ADOT&PF.

STUDY OBJECTIVES

Problems and Opportunities. The primary problem is the lack of adequate wave protection for the existing inner harbor facilities and moored vessels. The mooring basin is subject to severe damages and undesirable wave conditions from the Pacific Ocean and Settler Cove. Wave heights of three to five feet have been observed within the harbor limits. Significant portions of the mooring floats are unsafe and have been blocked off from public access or removed from the water. Year round use of the basin has been reduced from about 124 to 35 vessels. For the general Kodiak Island area, demand for year around moorage exceeds all planned expansion. A shortage of regional moorage that is both safe and convenient has led to lost income, vessel damages, lost time, and inconvenience.

Protected moorage would alleviate damages to vessels and harbor facilities. Additionally, protected moorage would reduce the risk of loss of life by providing protected shelter for vessels and reduce the need for harbor personnel to tend to vessels in the semi-protected harbor during storm events. Increased moorage capacity at Port Lions would reduce travel cost for vessels and increase vessel operating efficiencies.

Planning Objectives.

- Reduce damages to vessels incurred from inadequate protected moorage
- Reduce damages to existing float system incurred from inadequate wave protection
- Reduce travel costs incurred from the overcrowded conditions in the existing harbor

Planning Constraints.

- Minimize adverse impacts to water circulation and natural resources
- Maintain near-shore fish passage
- Maintain consistency with the Alaska Coastal Management Program

ALTERNATIVES

Plan Formulation Rationale. Initial plan formulation evaluated alternatives sites. Following selection of the recommended site a wide-range of alternatives was formulated based on information from previous reports, local knowledge, technical experts, and from information from the non-Federal sponsor. Initial screening of alternatives eliminated those that were beyond the scope of the study or would not meet the objectives and constraints such as alternatives that would require excessive upland development or would not provide near-shore breaches.

Management Measures and Alternative Plans. Alternatives were sized to accommodate the design fleet. After selection of the Recommended Plan, alternative fleet sizes were evaluated to optimize the project. Basin optimization is as follows:

Basin Size (# of vessels)	Project Cost (\$)	Annual O&M (\$)	Total Annual Project Cost (\$)	Annual Benefits (\$)	Net Benefits (\$)
0	0	0	0	0	0
62	8,830,000	25,000	537,000	700,000	163,000
124	10,088,000	25,000	610,000	884,000	274,000
186	11,525,000	25,000	693,000	924,000	231,000

Final Array of Alternatives. Detailed engineering designs and cost estimates were prepared to evaluate and compare the final three alternatives. The alternatives include a variety of wave protection measures using rubblemound and floating breakwaters, as discussed herein. The alternatives were configured to accommodate the design fleet.

Alternative 1A would consist of a 700-linear foot detached rubblemound breakwater that would be located seaward of the existing breakwater to provide protection from northeast waves. A 732-linear foot floating breakwater would provide protection for the small waves generated within Settlers Cove. The width of the near-shore breach at the existing breakwater would be reduced to 30 feet by extending the breakwater 40 feet shoreward. The existing stub breakwater would be extended seaward 75 feet. All other features of the existing project will remain the same. The breakwaters would provide protection for the mooring basin, which is -14 feet, MLLW. The entrance channel is 1,030 feet long by 150 feet wide with a depth of -14 feet, MLLW. Maintenance dredging would depend on storm conditions, but is expected to be infrequent, if necessary at all.

Alternative 1B incorporates the same northeast breakwater, but would use an 860-linear foot rubblemound breakwater to provide protection from southwest waves. The southwest breakwater would not be shore-connected to allow near-shore fish passage. All other features remain the same as described for Alternative 1A. Maintenance dredging would depend on storm conditions, but is expected to be infrequent, if necessary at all.

Alternative 3B would consist of a single southwest rubblemound breakwater 1,360 feet in length. The breakwater would be located landward of the existing breakwater and wrap around the deep-water side of the mooring basin to provide protection from northeast and southwest waves. The breakwater would not be shore-connected to provide a 150-foot wide breach for fish passage. The entrance channel would be 100-feet wide and would accommodate two-way vessel traffic. All other features remain the same as described for Alternative 1A. Maintenance dredging

would depend on storm conditions, but is expected to be infrequent, if necessary at all.

Comparison of Alternatives. The alternatives were designed to meet the planning objectives and criteria and were evaluated based on environmental, economic, and engineering considerations. All alternatives were equal for providing protected moorage and achieved the same level of NED benefits. Comparison of the alternatives focused on cost and impacts to the environment.

Key Assumptions. A detailed wind and wave analysis was not performed for this study. The study relied on the wave analysis conducted by the Waterways Experiment Station, which was performed in June 1982. A cursory analysis was performed by the Alaska District for this study, which verified the 1982 result.

Recommended Plan. Alternative 3B maximized the net NED benefits and minimize impacts to the environment and was selected as the NED Plan. This plan was acceptable to the local sponsor and the city of Port Lions and became the Recommended Plan. Major construction items include a rubblemound breakwater and moorage float system. No dredging would be required to construct the project. See Figure 3.

Systems / Watershed Context. The recommended plan is located in the marine waters adjacent to Port Lions. There is not upland component to the plan. The plan minimizes adverse impacts to the environment in the area. Formal consultation was conducted with the U.S. Fish and Wildlife Service.

Environmental Operating Principles. The recommended plan maximizes the balance of human need and impacts to the environment. The community and harbor users were involved in the planning process and endorse the recommended plan. Mitigation of impacts to the environment was incorporated into the project design and through additional features such as harbor light shields and development of a harbor management plan. The breakwater layout maximizes circulation within the harbor to provide sustainable water quality.

Independent Technical Review (ITR). An ITR was performed for the feasibility report and appendices and the environmental assessment. All ITR comments were resolved and back checked and the report has been certified as technically complete.

A legal review was conducted and the report has been certified as legally sufficient.

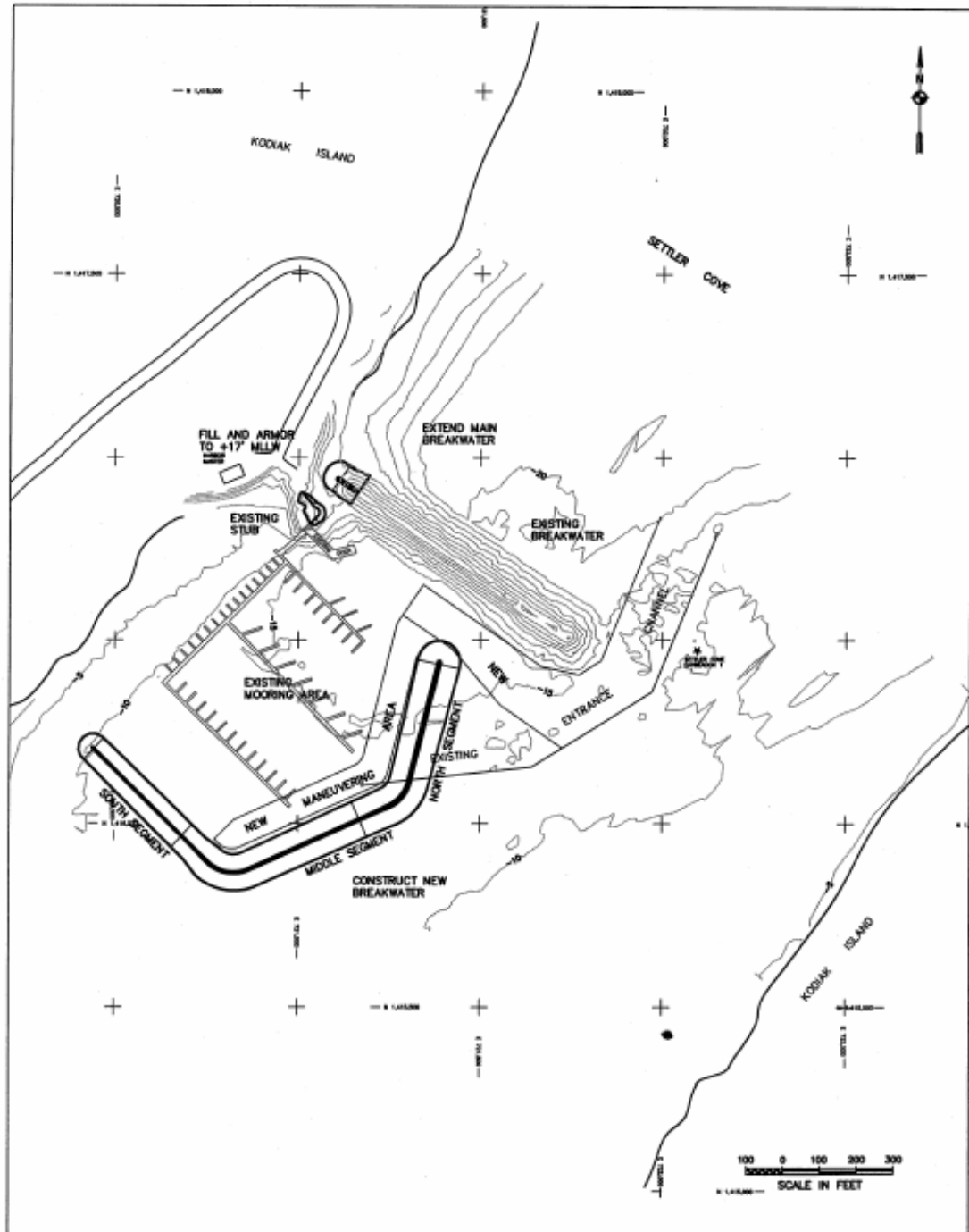


Figure 3. Recommended Plan

EXPECTED PROJECT PERFORMANCE

Project Costs. October 2004 price level

Construction Item	Project Cost
Mobilization and demobilization	\$ 946,000
Breakwaters	6,552,000
Preconstruction, engineering, & design	597,000
Construction management	697,000
LERRD	1,000
Aids to navigation	10,000
Mooring floats (includes design cost)	<u>1,038,000</u>
Total Project Construction Cost	\$ 9,841,000

Equivalent Annual Costs and Benefits. October 2004 Price Level, 50-Year Period of Analysis, 5-3/8 Percent Discount Rate

<u>Investment Costs</u>	
Total Project Construction Cost ¹	\$ 9,831,000
Interest During Construction	<u>\$ 257,000</u>
Total Investment Cost	\$ 10,088,000
<u>Average Annual Costs</u>	
Interest and Ammortization of Initial Investment Cost	\$ 585,000
OMRRR	<u>\$ 25,000</u>
Total Annual NED Cost	\$ 610,000
Average Annual NED Benefits	\$ 884,000
Net Annual Net NED Benefits	\$ 274,000
Benefits to Cost Ratio	1.5
Benefits to Cost Ratio (computed at 7%) ²	<u>1.2</u>

Cost Sharing. The cost of the recommended plan is \$9,841,000. The total non-federal share of the project is \$2,797,000, which includes \$1,759,000 for GNF and \$1,038,000 for the float system. The Federal share of the project is \$7,044,000, which includes \$10,000 for navigational aids. The U.S. Coast Guard would provide these navigation aids.

Project Implementation. The ADOT&PF would continue as the non-Federal sponsor during the construction phase of the project. The ADOT&PF may enter into a side agreement with the community of Port Lions for the operation and maintenance of the harbor following its construction.

¹ Total Project Construction Cost does not include the Aids to Navigation cost

² Per Executive Order 12893

Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R).

Federal. The Corps of Engineers would maintain the breakwaters and entrance and maneuvering channels as needed and would conduct periodic hydrographic surveys to determine if or when maintenance dredging is required. The U.S. Coast Guard would maintain navigational aids. The table below indicates OMRR&R intervals and costs, including mobilization and demobilization.

Local. The non-Federal sponsor would perform maintenance dredging of the mooring basin if necessary, maintain the floats, utilities, etc., and operate the completed project.

Annual OMRRR Costs

	Interval (yr)	Equivalent Annual Cost			
		Corps	Other Federal	Local Sponsor	Total
Replace 3% armor on breakwater	15	3,000			\$3,000
Maintenance dredging	25	3,000		3,000	6,000
Conduct hydrographic surveys	5	5,000			5,000
Maintain navigation aids	5		1,000		1,000
Replace floats, stalls, and piles	30			10,000	10,000
TOTAL OMRRR COSTS		\$11,000	\$1,000	\$13,000	\$25,000

Key Social and Environmental Factors. The recommended plan was designed to accommodate vessels of harbor users of Port Lions and other regional ports. Winter icing within the harbor was addressed by maximizing water circulation through breakwater configuration. Increasing water circulation minimized the potential for icing. Entrance channel currents were also a concern of vessel operators. The recommended plan would not produce adverse currents within the channel.

Key environmental factors included providing near-shore breaches and water circulation at the harbor site and within Settler Cove. Breaches were incorporated into the project to provide near-shore fish passage for juvenile salmon. The recommended plan minimized impacts to water circulation within Settler Cove. Mitigation features, such as breaches and breakwater layout for water circulation, are self-sustaining. The non-Federal sponsor will develop and implement a harbor management plan.

Stakeholder Perspectives and Differences. There was initial reluctance from the community to accept the recommended plan. The reluctance centered on the impression that the plan would not provide adequate wave protection at the harbor as compared to the other alternatives. Subsequent teleconferences and public meetings allowed the Corps to explain the function of the recommended plan and how it would provide protected moorage. There was also concern from the community that the recommended plan would trap winter ice and restrict vessel movements. Water circulation modeling by ADOT&PF indicated that circulation would be adequate to prevent the development of ice under normal winter conditions. These concerns have been resolved and the community has accepted the recommended plan.